

Docket No. F-8525

Ser. No. 10/520,154

AMENDMENTS TO THE SPECIFICATION:

Please amend the indicated paragraphs of the specification in accordance with the amendments indicated below.

Page 3, first paragraph:

Namely, the four-pole synchronous motor comprises: a cylindrical magnet rotor having four magnetic poles, the magnet rotor being supported in a housing and capable of rotating about an axis of an output shaft; and a stator, through which the output shaft is pierced, being provided in a space encased by the magnet rotor, the stator having a stator core, on which armature coils are formed with bobbins, wherein the stator core has first magnetic pole cores formed at both ends of a connection body part of crisscrossed connection body parts and second magnetic pole cores formed at both ends of the connection body part, the first magnetic pole cores include magnetic flux acting surface parts extended toward both sides thereof in a circumferential direction, and a shape of each magnetic flux acting surface part on one side of a longitudinal centerline of the first magnetic pole cores is different from that on the other side so as to be magnetically asymmetrical with respect to the longitudinal centerline.

Pages 7 and 8, paragraph bridging same:

Docket No. F-8525

Ser. No. 10/520,154

The magnet rotor 10 will be explained with reference to FIGS. 4-6. A boss 11 is fixed to a rotor case 12 by caulking, and the rotor case 12 is fitted to the output shaft 5 by the boss 11 and fixed thereto. The boss 11 is rotatably supported by the upper bearing 6, which is provided to the upper housing 1. The rotor case 12 is formed into a cup-shape, whose lower face is opened, and a cylindrical permanent magnet 13 is fixed on an inner circumferential face. Four magnetic poles N and S of the permanent magnet 13 are alternately magnetized in a circumferential direction with angular separations of 90 degrees. The permanent magnet 13 may be made of, for example, ferrite, rubber, plastic, samarium cobalt, rare earth metal, neodymium-iron-boron, etc. at low cost. Two bent pieces 14 and notches 15 are formed in an outer circumferential face of the rotor case 12 by inwardly bending the pieces, which have been partially cut in the circumferential direction. The bent pieces 14 are used as positioning means (stoppers) for correctly attaching the permanent magnet 13 in the rotor case 12 (see FIG. 4A), and the notches 15 act as ventilation holes for diffusing heat generated by the stator 16. As described above, the boss 12 is attached to the output shaft 5, so that the magnet rotor 10 is rotatably supported by the housing 4. When an electric power is applied, the magnet rotor 10 is started to rotate about an axis of the output shaft 5 by repulsion to the magnetic poles of the stator 16.

Pages 9 and 10, paragraph bridging same:

Docket No. F-8525

Ser. No. 10/520,154

Next, the structure of the stator 16 will be explained with reference to FIGS. 3, 7A, 15 and 16. In FIGS. 7A and 7B, the stator core 23 has magnetic flux acting surface parts 37, which are extended from the first magnetic pole cores 36 toward both sides in the circumferential direction, and a shape of each magnetic flux acting surface part 37 on one side of a longitudinal centerline M of the first magnetic pole cores 36 is different from that on the other side so as to be magnetically asymmetrical with respect to the longitudinal centerline M. For example, concave sections 38 are formed in the magnetic flux acting surface parts 37 of the first magnetic pole cores 36, which face the magnet rotor 10, so that gaps (spaces) are formed with respect to the magnetic poles of the rotor; therefore, magnetic fluxes, which are generated from the magnetic flux acting surface parts 37, on the right side and the left side of the center line M are overbalanced, and the magnetic fluxes are shifted toward low magnetic resistance parts, in which no concave sections 38 are formed, or biased in the clockwise direction. In FIG. 3, the concave sections 38 of the magnetic flux acting surface parts 37 of the first magnetic pole cores 36 are point-symmetrically formed (separated with an angular separation of 180 degrees) with respect to the axis of the output shaft 5. Magnetic permeability of the stator core 23 is greater than that of the auxiliary cores 34 and 35. For example, the stator core 23 is made by piling silicon steel plates.